



1600

RAW SEQUENCE LISTING

DATE: 01/28/2004

PATENT APPLICATION: US/09/686,647A

TIME: 13:53:04

Input Set : A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT

Output Set: N:\CRF4\01282004\I686647A.raw

4 <110> APPLICANT: The Rockefeller University
 5 Jeffrey M. Friedman
 6 Yiyiing Zhang
 7 Ricardo Proenca
 8 Margherita Maffei
 9 Jeffrey L. Halaas
 10 Ketan Gajiwala
 11 Stephen K. Burley
 13 <120> TITLE OF INVENTION: MODULATORS OF BODY WEIGHT, CORRESPONDING
 14 NUCLEIC ACIDS AND PROTEINS, AND DIAGNOSTIC AND THERAPEUTIC
 15 USES THEREOF
 17 <130> FILE REFERENCE: 600-1-087/CIPDIVCON
 19 <140> CURRENT APPLICATION NUMBER: 09/686,647A
 20 <141> CURRENT FILING DATE: 2000-10-10
 22 <150> PRIOR APPLICATION NUMBER: 09/183,374
 23 <151> PRIOR FILING DATE: 1998-10-30
 25 <150> PRIOR APPLICATION NUMBER: 08/347,563
 26 <151> PRIOR FILING DATE: 1994-11-30
 28 <150> PRIOR APPLICATION NUMBER: 08/292,345
 29 <151> PRIOR FILING DATE: 1994-08-17
 31 <160> NUMBER OF SEQ ID NOS: 42
 33 <170> SOFTWARE: FastSEQ for Windows Version 4.0
 35 <210> SEQ ID NO: 1
 36 <211> LENGTH: 2793
 37 <212> TYPE: DNA
 38 <213> ORGANISM: murine
 40 <400> SEQUENCE: 1

ENTERED

41 ggatccctgc tccagcagct gcaaggtgca agaagaagaa gatcccaggg aggaaaatgt 60
 42 gctggagacc cctgtgtcgg ttcctgtggc tttggtccta tctgtcttat gttcaagcag 120
 43 tgcctatcca gaaagtccag gatgacacca aaaccctcat caagaccatt gtcaccagga 180
 44 tcaatgacat ttcacacacg cagtcggtat ccgccaagca gagggctcact ggcttggact 240
 45 tcatttcctgg gcttcacccc attctgagtt tgtccaagat ggaccagact ctggcagtct 300
 46 atcaacaggt cctcaccagc ctgccttccc aaaatgtgct gcagatagcc aatgacctgg 360
 47 agaatctccg agacctctc catctgctgg ccttctccaa gagctgctcc ctgcctcaga 420
 48 ccagtggcct gcagaagcca gagagcctgg atggcgctcc ggaagcctca ctctactcca 480
 49 cagaggtggg ggctttgagc aggctgcagg gctctctgca ggacattctt caacagttgg 540
 50 atgttagccc tgaatgctga agtttcaaag gccaccaggc tccaagaat catgtagagg 600
 51 gaagaaacct tggcttccag gggctctcag gagaagagag ccatgtgcac acatccatca 660
 52 ttcattttctc tccctcctgt agaccacca tccaaaggca tgactccaca atgcttgact 720
 53 caagttatcc acacaacttc atgagcacia ggagggggcca gcctgcagag gggactctca 780
 54 cctagttctt cagcaagtag agataagagc catcccatcc cctccatgtc ccacctgctc 840
 55 cgggtacatg ttcctccgtg ggtacacgct tcgctgcggc ccaggagagg tgaggtaggg 900
 56 atgggtagag cttttgggct gtctcagagt ctttggggagc accgtgaagg ctgcatccac 960

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57 acacagctgg aaactcccaa gcagcacacg atggaagcac ttattttattt attctgcatt 1020
58 ctatttttga tggatctgaa gcaaggcatc agctttttca ggctttgggg gtcagccagg 1080
59 atgaggaagg ctccctgggt gctgctttca atcctattga tgggtctgcc cgaggcaaac 1140
60 ctaatttttg agtgactgga aggaagggtt ggatcttcca aacaagagtc tatgcaggta 1200
61 gcgctcaaga ttgacctctg gtgactggtt ttgtttctat tgtgactgac tctatccaaa 1260
62 cacgtttgca gcggcattgc cgggagcata ggctagggtta ttatcaaaag cagatgaatt 1320
63 ttgtcaagtg taatatgtat ctatgtgcac ctgagggtag aggatgtgtt agaggagggt 1380
64 tgaaggatcc ggaagtgttc tctgaattac atatgtgtgg taggcttttc tgaaagggtg 1440
65 aggcattttc ttacctctgt ggccacatag tgtggctttg tgaaaaggac aaaggagttg 1500
66 actctttccg gaacattttg agtgtaccag gcacccttgg aggggctaaa gctacaggcc 1560
67 ttttgttggc atattgctga gctcagggtg tgagggtccc acatttgaga cagttagccc 1620
68 caagaaaagg gtccctggtg tagatctcca aggttgtcca gggttgatct cacaatgcgt 1680
69 ttcttaagca ggtagacgtt tgcatgccaa tatgtggttc tcatctgatt ggttcatcca 1740
70 aagtagaacc ctgtctccca cccattctgt ggggagtttt gttccagtgg gaatgagaaa 1800
71 tcaacttagc gatggtcctg agccctgggc cagcactgct gaggaagtgc cagggtccca 1860
72 ggccaggctg ccagaattgc ccttcgggct ggaggatgaa caaaggggct tgggtttttc 1920
73 catcaccctc gcaccctatg tcaccatcaa actggggggc agatcagtga gaggacactt 1980
74 gatggaaagc aatacacttt aagactgagc acagtttcgt gctcagctct gtctggtgct 2040
75 gtgagctaga gaagctcacc acatacatat aaaaatcaga ggctcatgtc cctgtggtta 2100
76 gaccctactc gcggcgggtg actccaccac agcagcaccg caccgctgga agtacagtgc 2160
77 tgtcttcaac aggtgtgaaa gaacctgagc tgagggtgac agtgcccagg ggaacctgc 2220
78 ttgcagtcta ttgcatttac ataccgcatt tcagggcaca ttagcatcca ctccatggt 2280
79 agcacactgt tgacaatagg acaagggata ggggttgact atcccttacc caaatgctt 2340
80 gggactagaa gagtttttga ttttagagtc ttttcaggca taggtatatt tgagtatata 2400
81 taaaatgaga tatcttgggt atggggccca agtataaaca tgaagttcat ttatatitca 2460
82 taataccgta tagacactgc ttgaagtgtg gttttatata gtgtttttaa taacgttgta 2520
83 tgcatgaaag acgtttttac agcatgaacc tgtctactca tgccagcact caaaaacct 2580
84 ggggttttgg agcagtttgg atcttgggtt ttctgttaag agatggttag cttataccta 2640
85 aaaccataat ggcaaacagg ctgcaggacc agactggatc ctcagccctg aagtgtgcc 2700
86 ttccagccag gtcataccct gtggaggtga gcgggatcag gttttgtggt gctaagagag 2760
87 gagttggagg tagattttgg aggatctgag ggc 2793

```

89 <210> SEQ ID NO: 2

90 <211> LENGTH: 167

91 <212> TYPE: PRT

92 <213> ORGANISM: murine

94 <400> SEQUENCE: 2

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95 Met Cys Trp Arg Pro Leu Cys Arg Phe Leu Trp Leu Trp Ser Tyr Leu
96 1 5 10 15
97 Ser Tyr Val Gln Ala Val Pro Ile Gln Lys Val Gln Asp Asp Thr Lys
98 20 25 30
99 Thr Leu Ile Lys Thr Ile Val Thr Arg Ile Asn Asp Ile Ser His Thr
100 35 40 45
101 Gln Ser Val Ser Ala Lys Gln Arg Val Thr Gly Leu Asp Phe Ile Pro
102 50 55 60
103 Gly Leu His Pro Ile Leu Ser Leu Ser Lys Met Asp Gln Thr Leu Ala
104 65 70 75 80
105 Val Tyr Gln Gln Val Leu Thr Ser Leu Pro Ser Gln Asn Val Leu Gln
106 85 90 95
107 Ile Ala Asn Asp Leu Glu Asn Leu Arg Asp Leu Leu His Leu Leu Ala

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Input Set : A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT

Output Set: N:\CRF4\01282004\I686647A.raw

```

108          100          105          110
109 Phe Ser Lys Ser Cys Ser Leu Pro Gln Thr Ser Gly Leu Gln Lys Pro
110          115          120          125
111 Glu Ser Leu Asp Gly Val Leu Glu Ala Ser Leu Tyr Ser Thr Glu Val
112          130          135          140
113 Val Ala Leu Ser Arg Leu Gln Gly Ser Leu Gln Asp Ile Leu Gln Gln
114 145          150          155          160
115 Leu Asp Val Ser Pro Glu Cys
116          165

```

119 <210> SEQ ID NO: 3

120 <211> LENGTH: 700

121 <212> TYPE: DNA

122 <213> ORGANISM: Homo sapiens

124 <220> FEATURE:

125 <221> NAME/KEY: misc_feature

126 <222> LOCATION: 1, 2, 3, 5, 6, 29, 30, 31, 581

127 <223> OTHER INFORMATION: n = A,T,C or G

129 <221> NAME/KEY: misc_feature

130 <222> LOCATION: (0)...(0)

W--> 132 <400> 3

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W--> 133 nnnngnngttg caaggcccaa gaagcccann ntctctgggaa ggaaaatgca ttggggaacc 60
134 ctgtgcggat tcttgtggct ttggccctat cttttctatg tccaagctgt gcccatccaa 120
135 aaagtccaag atgacaccaa aaccctcatc aagacaattg tcaccaggat caatgacatt 180
136 tcacacacgc agtcagtctc ctccaaacag aaagtcaccg gtttgactt cattcctggg 240
137 ctccacccca tcctgacctt atccaagatg gaccagacac tggcagtcta ccaacagatc 300
138 ctcaccagta tgccttccag aaacgtgatc caaatatcca acgacctgga gaacctccg 360
139 gatcttcttc acgtgctggc cttctctaag agctgccact tgccctgggc cagtggcctg 420
140 gagaccttgg acagcctggg ggggtgtcctg gaagcttcag gctactccac agaggtgggtg 480
141 gccctgagca ggctgcaggg gtctctgcag gacatgctgt ggcagctgga cctcagccct 540
142 ggggtgctgag gccttgaagg tcaactcttc tgcaaggact nacgttaagg gaaggaactc 600
143 tgggttccag gtatctccag gattgaagag cattgcatgg acaccctta tccaggactc 660
144 tgtcaatttc cctgactcct ctaagccact cttccaaagg 700

```

146 <210> SEQ ID NO: 4

147 <211> LENGTH: 167

148 <212> TYPE: PRT

149 <213> ORGANISM: Homo sapiens

151 <400> SEQUENCE: 4

```

152 Met His Trp Gly Thr Leu Cys Gly Phe Leu Trp Leu Trp Pro Tyr Leu
153 1          5          10          15
154 Phe Tyr Val Gln Ala Val Pro Ile Gln Lys Val Gln Asp Asp Thr Lys
155          20          25          30
156 Thr Leu Ile Lys Thr Ile Val Thr Arg Ile Asn Asp Ile Ser His Thr
157          35          40          45
158 Gln Ser Val Ser Ser Lys Gln Lys Val Thr Gly Leu Asp Phe Ile Pro
159          50          55          60
160 Gly Leu His Pro Ile Leu Thr Leu Ser Lys Met Asp Gln Thr Leu Ala
161 65          70          75          80
162 Val Tyr Gln Gln Ile Leu Thr Ser Met Pro Ser Arg Asn Val Ile Gln
163          85          90          95

```

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```

164 Ile Ser Asn Asp Leu Glu Asn Leu Arg Asp Leu Leu His Val Leu Ala
165           100           105           110
166 Phe Ser Lys Ser Cys His Leu Pro Trp Ala Ser Gly Leu Glu Thr Leu
167           115           120           125
168 Asp Ser Leu Gly Gly Val Leu Glu Ala Ser Gly Tyr Ser Thr Glu Val
169           130           135           140
170 Val Ala Leu Ser Arg Leu Gln Gly Ser Leu Gln Asp Met Leu Trp Gln
171 145           150           155           160
172 Leu Asp Leu Ser Pro Gly Cys
173           165
176 <210> SEQ ID NO: 5
177 <211> LENGTH: 166
178 <212> TYPE: PRT
179 <213> ORGANISM: Murine
181 <400> SEQUENCE: 5
182 Met Cys Trp Arg Pro Leu Cys Arg Phe Leu Trp Leu Trp Ser Tyr Leu
183 1           5           10           15
184 Ser Tyr Val Gln Ala Val Pro Ile Gln Lys Val Gln Asp Asp Thr Lys
185           20           25           30
186 Thr Leu Ile Lys Thr Ile Val Thr Arg Ile Asn Asp Ile Ser His Thr
187           35           40           45
188 Ser Val Ser Ala Lys Gln Arg Val Thr Gly Leu Asp Phe Ile Pro Gly
189           50           55           60
190 Leu His Pro Ile Leu Ser Leu Ser Lys Met Asp Gln Thr Leu Ala Val
191 65           70           75           80
192 Tyr Gln Gln Val Leu Thr Ser Leu Pro Ser Gln Asn Val Leu Gln Ile
193           85           90           95
194 Ala Asn Asp Leu Glu Asn Leu Arg Asp Leu Leu His Leu Leu Ala Phe
195           100           105           110
196 Ser Lys Ser Cys Ser Leu Pro Gln Thr Ser Gly Leu Gln Lys Pro Glu
197           115           120           125
198 Ser Leu Asp Gly Val Leu Glu Ala Ser Leu Tyr Ser Thr Glu Val Val
199           130           135           140
200 Ala Leu Ser Arg Leu Gln Gly Ser Leu Gln Asp Ile Leu Gln Gln Leu
201 145           150           155           160
202 Asp Val Ser Pro Glu Cys
203           165
206 <210> SEQ ID NO: 6
207 <211> LENGTH: 166
208 <212> TYPE: PRT
209 <213> ORGANISM: Homo sapiens
211 <400> SEQUENCE: 6
212 Met His Trp Gly Thr Leu Cys Gly Phe Leu Trp Leu Trp Pro Tyr Leu
213 1           5           10           15
214 Phe Tyr Val Gln Ala Val Pro Ile Gln Lys Val Gln Asp Asp Thr Lys
215           20           25           30
216 Thr Leu Ile Lys Thr Ile Val Thr Arg Ile Asn Asp Ile Ser His Thr
217           35           40           45
218 Ser Val Ser Ser Lys Gln Lys Val Thr Gly Leu Asp Phe Ile Pro Gly

```

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Input Set : A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT

Output Set: N:\CRF4\01282004\I686647A.raw

```

219      50      55      60
220 Leu His Pro Ile Leu Thr Leu Ser Lys Met Asp Gln Thr Leu Ala Val
221 65      70      75      80
222 Tyr Gln Gln Ile Leu Thr Ser Met Pro Ser Arg Asn Val Ile Gln Ile
223      85      90      95
224 Ser Asn Asp Leu Glu Asn Leu Arg Asp Leu Leu His Val Leu Ala Phe
225      100      105      110
226 Ser Lys Ser Cys His Leu Pro Trp Ala Ser Gly Leu Glu Thr Leu Asp
227      115      120      125
228 Ser Leu Gly Gly Val Leu Glu Ala Ser Gly Tyr Ser Thr Glu Val Val
229      130      135      140
230 Ala Leu Ser Arg Leu Gln Gly Ser Leu Gln Asp Met Leu Trp Gln Leu
231 145      150      155      160
232 Asp Leu Ser Pro Gly Cys
233      165
236 <210> SEQ ID NO: 7
237 <211> LENGTH: 176
238 <212> TYPE: DNA
239 <213> ORGANISM: Mus musculus
241 <220> FEATURE:
242 <221> NAME/KEY: misc_feature
243 <222> LOCATION: 61, 66, 89, 151, 164
244 <223> OTHER INFORMATION: n = A,T,C or G
246 <400> SEQUENCE: 7
247 gtgcaagaag aagaagatcc cagggcagga aaatgtgctg gagacccttg tgtcgggtcc 60
W--> 248 ngtggntttg gtcctatctg tcttatgtnc aagcagtgcc tatccagaaa gtccaggatg 120
249 acaccaaaag cctcatcaag accattgtca ncaggatcac tganatttca cacacg 176
251 <210> SEQ ID NO: 8
252 <211> LENGTH: 18
253 <212> TYPE: DNA
254 <213> ORGANISM: Artificial Sequence
256 <220> FEATURE:
257 <223> OTHER INFORMATION: PCR 5' primer for exon 2G7
259 <400> SEQUENCE: 8
260 ccagggcagg aaaatgtg 18
262 <210> SEQ ID NO: 9
263 <211> LENGTH: 22
264 <212> TYPE: DNA
265 <213> ORGANISM: Artificial Sequence
267 <220> FEATURE:
268 <223> OTHER INFORMATION: PCR 3' primer for exon 2G7
270 <400> SEQUENCE: 9
271 catcctggac tttctggata gg 22
273 <210> SEQ ID NO: 10
274 <211> LENGTH: 23
275 <212> TYPE: PRT
276 <213> ORGANISM: Murine
278 <400> SEQUENCE: 10
279 Met Cys Trp Arg Pro Leu Cys Arg Phe Leu Trp Leu Trp Ser Tyr Leu

```

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/09/686,647A

DATE: 01/28/2004
TIME: 13:53:05

Input Set : A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT
Output Set: N:\CRF4\01282004\I686647A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:3; N Pos. ~~1, 2, 3, 5, 6, 29, 30, 31, 581~~
Seq#:7; N Pos. ~~61, 66, 89, 151, 164~~
Seq#:22; N Pos. 361, 385, 397
Seq#:24; N Pos. 145, 285

VERIFICATION SUMMARY

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Input Set : A:\600-1-087CIPDIVCON - SEQUENCE LISTING.TXT

Output Set: N:\CRF4\01282004\I686647A.raw

L:132 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3
L:133 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 after pos.:0
M:341 Repeated in SeqNo=3
L:248 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:60
M:341 Repeated in SeqNo=7
L:293 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:297 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:301 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:304 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:308 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:312 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:11
L:461 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22
L:465 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22
L:470 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22
L:475 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22
L:494 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:22 after pos.:321
M:341 Repeated in SeqNo=22
L:524 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24
L:528 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24
L:533 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24
L:538 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24
L:541 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:24 after pos.:120
M:341 Repeated in SeqNo=24